

# **A STUDY OF CORRELATION OF PREOPERATIVE ULTRASONOGRAPHIC AIRWAY ASSESSMENT AND CLINICAL ASSESSMENT IN PREDICTION OF THE DIFFICULT AIRWAY**

## **ABSTRACT**

### **BACKGROUND**

Difficult intubation is associated with serious morbidity and mortality and cannot be always predicted by conventional clinical predictors. Ultrasonographic airway assessment could be a useful predictor of difficult airway and it thus correlates with various clinical and laryngoscopic view of airway which is the Cormack-Lehane grading.

### **AIMS AND OBJECTIVES**

To find out the correlation between Ultrasonographic airway assessment and clinical airway assessment for difficult airway prediction and to compare the results with CORMACK – LEHANE scoring during intubation. To find out the sensitivity, specificity, positive and negative predictive value

### **MATERIALS AND METHODS**

The study population includes 150 adult patients undergoing elective surgery requiring general Anaesthesia. This is a prospective randomized observational study where both the clinical airway assessment parameters and ultrasonographic parameters are noted and correlated. In clinical assessment – Modified Mallampati class, mouth opening , dentition ,thyromental distance , Hyomental distance, Sternomental distance and neck movements were assessed. In ultrasonographic parameters - Width of the tongue, Cross sectional area of the floor of the mouth, Anteroposterior thickness of the geniohyoid muscle, Skin to hyoid distance and

Skin to epiglottis distance were assessed. In mid sagittal view – cross sectional area of tongue, Mentohyoid distance were assessed. The anterior neck soft tissue thickness at the level of hyoid and vocal cord were assessed. All these parameters were compared with the Cormack – Lehane grading.

## **RESULTS:**

One hundred and fifty adult patients undergoing elective surgery under general Anaesthesia by endotracheal intubation were included in my study. My study included population aged between 18 to 60 years with 74% male patients and 35.5% female patients. The BMI- Body mass index of the study population ranged from 21.63 to 34.89 kg/m<sup>2</sup>. 40% of patients belonged to Cormack Lehane grade I. 41.3% of patients belonged to Cormack Lehane grade II. 16% of the patients belonged to Cormack Lehane grade III and the remaining 2% of the population belonged to grade IV.

The distribution of Cormack Lehane grade was compared with the ultrasound parameters i.e., ANS-HYOID (Anterior neck soft tissue – at the level of hyoid), ANS -VC (Anterior neck soft tissue – vocal cord), PRE-E (Pre-epiglottic space), E-VC (Epiglottis to vocal cord distance), PRE-E/E-VC. The four groups in Cormack Lehane grade were analyzed comparing with each of the parameters. The Anterior neck soft tissue at the hyoid level was not significant with p value 0.46 and hence it suggests that it does not correlate with Cormack Lehane grading. The anterior neck soft tissue at the vocal cord level was calculated and the analysis with Cormack Lehane grading suggests that it is statistically significant with p value less than 0.0001. Hence it correlates with Cormack Lehane grade. The distance from skin to epiglottis which is Pre epiglottic space distance( p value < 0.0001 ) , epiglottis to vocal cord distance ( E-VC - p value <0.0001 ) and the ratio of Pre-Epiglottis space and epiglottis to Vocal cord distance is also statistically

significant. Their ratio is also statistically significant. Hence these values are found to predict difficult intubation.

The distribution of Cormack Lehane grading was compared to Mallampatti grading, thyromental distance and sternomental distance. The analysis was statistically significant and thus it indicates that there is correlation between these parameters and CL grading.

Anterior Neck Soft tissue- Vocal cord level had the highest sensitivity more than the clinical parameters. But its specificity was lower than the clinical parameters. Sternomental distance had the highest specificity. Negative predictive value was highest for Anterior neck soft tissue – Vocal cord followed by Mallampatti class. Pre – Epiglottis / Epiglottis- Vocal Cord was useful in predicting difficult intubation. But it had very low sensitivity. Specificity was high. The clinical parameter Mallampatti class had high specificity and negative predictive value. The hyomental distance was calculated for all patients. It was found that out of 123 patients who had CL grade 1/2, 110 had HMD > 5.5 cm (89.4%). The patients with CL grade 3/4, HMD was less than 5.5cm for 23 population (85.2%).

## **CONCLUSION**

Ultrasonographic measurement of the Anterior neck soft tissue -Vocal Cord is thus an excellent predictor of difficult intubation. This is the most sensitive parameter compared to other clinical parameters. Measurement of Anterior neck soft tissue -Hyoid is not a useful indicator in predicting difficult intubation. Thus, the parameters can be used to predict the difficulty which was until now quantified by the traditional Cormack- Lehane grading.

**KEYWORDS** Airway assessment, clinical assessment, ultrasonography, Cormack-lehane

